

What is claimed is:

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1. In a disc drive having a plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that the tracks on the recording surfaces at each given radius make up a cylinder, a corresponding plurality of heads adjacent the respective recording surfaces, a servo circuit which selectively performs seeks to move the heads from an initial track to a destination track, and a control processor which schedules a plurality of pending access commands stored in a command queue, a method for optimizing the transfer of data between the recording surfaces and a host computer, comprising steps of:

- 10
- (a) determining a radial positional offset between a presently active head and a different, target head with respect to the corresponding recording surfaces;
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- (b) identifying an estimated seek distance comprising a radial distance between an initial track over which the presently selected head is disposed and a destination cylinder having a destination track to which the target head is to be moved;
- (c) identifying a corrected seek distance in relation to the positional offset;
- (d) obtaining a corrected seek time from a seek profile table in relation to
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- the corrected seek distance; and
- (e) using the corrected seek time to schedule an access command associated with the destination track.

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2. The method of claim 1, in which the determining step (a) further comprises a step of storing the measured positional offset values in a head offset table in memory accessible by the control processor.

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3. The method of claim 1, in which the identifying step (c) further comprises a step of rounding the corrected seek distance to the nearest whole number of tracks.

4. The method of claim 1, further comprising a step of:

(f) executing a seek to place the target head over the destination track.

5. The method of claim 4, in which the executing step (f) comprises
5 steps of:

(f1) applying current to an actuator motor to move the presently active head
to a final cylinder different from the destination cylinder while
using the presently active head to transduce servo data from the
associated recording surface, wherein a radial distance between the
10 final cylinder and the destination cylinder is nominally equal to the
radial positional offset between the presently selected head and the
target head; and

(f2) performing a head switching operation to switch to the target head so
that the target head transduces servo data from the associated
15 recording surface, wherein at the conclusion of the head switching
operation the target head is nominally over the destination track.

6. The method of claim 4, in which the executing step (f) comprises
20 steps of:

(f1) performing a head switching operation to switch to the target head; and
(f2) applying current to an actuator motor to move the target head to the
destination cylinder while using the target head to transduce servo
data from the associated recording surface.

7. A disc drive, comprising:

a plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that the tracks on the recording surfaces at each given radius make up a cylinder;

5 a corresponding plurality of heads which store data to and retrieve data from the data tracks on the associated recording surfaces;

a servo circuit which selectively performs seeks to move the heads from an initial track to a destination track;

10 a memory which stores a plurality of pending access commands received from a host computer; and

3 a control processor which controls the transfer of data between the recording surfaces and the host computer in response to each access command, in which the control processor schedules the execution of the pending access commands in relation to a corrected seek time for each pending access command determined in relation to an estimated seek length as a radial distance between an initial cylinder over which a presently active head is located and a destination cylinder having a destination track corresponding to the associated access command, a radial positional offset value between the presently active head and a different, target head associated with the recording surface having the destination track, and a table of estimated seek times by seek length.

25 8. The disc drive of claim 7, in which the control processor stores the radial positional offset values in a head offset table in a memory accessible by the control processor.

30 9. The disc drive of claim 7, in which the servo circuit performs a selected one of the pending access commands to place the associated target head over the associated destination track by applying current to an actuator motor to move the presently active head to a final cylinder different from the destination

cylinder while using the presently active head to transduce servo data from the associated recording surface, wherein a radial distance between the final cylinder and the destination cylinder is nominally equal to the radial positional offset value between the presently selected head and the associated target head, and then performing a head switching operation to switch to the associated target head so that the associated target head transduces servo data from the associated recording surface, wherein at the conclusion of the head switching operation the associated target head is nominally over the destination track.

10. The disc drive of claim 7, in which the servo circuit performs a selected one of the pending access commands to place the associated target head over the associated destination track by performing a head switching operation to switch to the associated target head, and then applying current to an actuator motor to move the associated target head to the destination cylinder while using the associated target head to transduce servo data from the associated recording surface.

11. The disc drive of claim 1, in which the control processor rounds the corrected seek distance to the nearest whole number of tracks, and then identifies the corrected seek time from the table of estimated seek times by seek length using the rounded, corrected seek distance.

12. A disc drive, comprising:

a plurality of heads adjacent a corresponding plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that the tracks on the recording surfaces at each given radius make up a cylinder; and

means for scheduling a plurality of pending access commands from a host computer to access a corresponding plurality of destination tracks on different recording surfaces each having an associated target head different from a presently active head, by determining a corrected seek time for each of the pending access commands which accounts for radial positional offset between the presently active head and the associated target head.

13. The disc drive of claim 12, wherein the means for scheduling comprises a control processor which schedules the execution of the pending access commands in relation to the corrected seek time for each pending access command determined in relation to an estimated seek length as a radial distance between an initial cylinder over which the presently active head is located and a destination cylinder having a destination track corresponding to the associated access command, a radial positional offset value between the presently active head and the associated target head, and a table of estimated seek times by seek length.

14. The disc drive of claim 12, wherein the means for scheduling performs steps of:

(a) determining a radial positional offset value between the presently active head and the associated target head with respect to the corresponding recording surfaces;

(b) identifying an estimated seek distance comprising a radial distance between an initial track over which the presently selected head is disposed and a destination cylinder having a destination track to which the associated target head is to be moved;

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1. The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1) are bounded and tend to zero as $t \rightarrow \infty$.